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ABSTRACT

Metaphors, figures of speech of one sort or another, similes, and analogies are not strangers to technical writing. Four exercises that seem typical of most technical writing syllabi and that seem appropriate points for the introduction of students to metaphors and other figures are (1) a technical description, which requires the student to prepare a technical description of an artifact using similes; (2) definition of a technical principle, requiring students to choose a principle from their respective disciplines and develop an extended definition suitable for a lay reader through the use of metaphor; (3) description of a mechanism or procedure; and (4) instructions, which presents students with prepared geometric designs that have been cut into pieces and asks them to design a set of instructions that will allow the reader to reassemble the pieces into the original geometric design. Metaphors and other figurative language can provide technical writing students with alternative strategies to make things "knowable" and "seeable" in the most literal sense. (HOD)

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THE CREATION OF METAPHOR:

A CASE FOR FIGURATIVE LANGUAGE

IN TECHNICAL WRITING

CLASSES

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THE CREATION OF METAPHOR: A CASE FOR FIGURATIVE LANGUAGE IN TECHNICAL WRITING

It may perhaps seem strange to speak of metaphor in the same breath as instruction in technical writing. But based on what Professor Rosner has shown us about changes in technical writing, as they are reflected historically in textbooks since the 1920s, and on my own perceptions of directions in technical writing today, I could justifiably assert that we have nearly come full circle.[1] In the beginning was the word. When technical writing first began to be separated from other advanced writing courses, it retained many of the strategies and approaches of Advanced Exposition courses--the study of rhetoric, logical organization, conventions, formats. Early texts show this connection. Later, as technical writing teachers began to pursue their own directions in research, their teaching approaches and the textbooks they created began to reflect new discoveries and directions: psycholinguistics crept in; more materials on audience analysis began to show up in texts; management psychology ala Abraham Maslow and others appeared; conventional report formats were reflected; readability formulas became a staple of textbooks. But for a while, rhetorical approaches still held sway. Today, of course, only a few commentators will argue for some return to the older liberal arts traditions, myself among them. But these few are a vocal lot.

At the 1980s Conference on College Composition and Communication, one of the sessions on Technical Writing instruction, chaired by Elizabeth Harris,

was devoted to exactly this point--a return to a liberal arts tradition in technical writing instruction. At last year's MLA convention and at the one coming up in December 1982, several of our colleagues did (or will) discuss the pros and cons of a liberal arts approach--including rhetoric--to the teaching of technical and scientific writing.[2] I personally know of three texts in progress that are governed by a rhetorical approach; and if one considers those governed by a "process" approach, the number perhaps doubles or triples. Clearly, I am not alone in my argument for some treatment of matters rhetorical in technical writing courses.

Metaphors, figures of one sort or another, similes, analogies--perhaps they are not such strangers to technical writing or the process of composing in technical writing as they first seem.[3] Let me interject here that I'm not arguing for a syllabus which includes the 500 or so figures, tropes, and schemes of Classical rhetoric. While such an approach might indeed be valuable, it is neither practical nor practicable. Many of us already feel the constraints of time in our classes. How could we add anything? Incorporate perhaps is a better word.

What I am proposing, though, is that certain figures deserve our attention. Scientists have long recognized the power of the metaphor, for instance. Niels Bohr, Nobel laureate in Physics in 1922, is quoted as having said, "When it comes to atoms, language can be used only as in poetry. The poet, too, is not nearly so concerned with describing facts as with creating images."[4] The unseeable, the unknowable, require more than a little imagination in a technical description. Aristotle prized the metaphor for its ability to create knowledge--to bridge the commonplace and the unknown. Similarly, Quintilian valued it as the most "beautiful of the tropes," one capable of

"providing a name for everything."[5]

For many of our students, the metaphor, the simile, the analogy would serve well in their exercises in definition or description written for lay readers. Because here they cannot depend on the standard vocabulary of their disciplines, they need alternative strategies to present the required information--that is, to make things knowable and seeable in the most literal sense

How can we best incorporate exercises in the development of metaphor, simile, and analogy into our technical writing courses? Where might they be most useful for students, given the types of writing they might do professionally and given the types of assignments we routinely make in technical writing? In the following examples I've tried to make suggestions that will fit easily into typical course outlines. The four exercises here seem to me typical of most technical writing syllabi and appropriate points for the introduction of metaphors and other figures.

Assignment one: a technical description. Here the student is asked to prepare a technical description of an artifact. Instructors should try to pick some object that is small, but detailed. It's amazing how much detail one can find in the winding stem of a watch, for instance, if one looks carefully. In fact, this assignment is designed with that end in mind. Many of our students do not look carefully at anything, even though they are supposedly the "visual" generation. We need to train them to search for detail. In this assignment students are writing for a lay reader--that is, one who has little or no previous experience with the artifact at hand. If we choose well, we can almost insure that our students will themselves be looking at the artifact as lay readers. In an essay entitled "The Creative

Heritage," Mark Van Doren remarks that the major difference between skilled writers and the rest of us is that writers have better vision. I think we can take this statement literally: if we can train our students to develop better vision, to see objects clearly and perhaps through a new set of eyes, we will have contributed something very important to their development as writers.

In this first assignment we can introduce the simile. Students are encouraged to find similarities between the object being described and commonplace objects with which the reader will be familiar, and to incorporate these as similes in their technical descriptions. (A word of caution is needed here. The instructor needs to remind students that all similarities are not figures. Some will be literal comparisons.)

As for the artifacts themselves, it doesn't matter much what you choose so long as there is sufficient detail to insure that students will be challenged to develop concrete descriptions. I've used all sorts of objects. In fact, I have something of a grab bag filled with bits and pieces of home projects, old tools (or parts of tools), kitchen utensils (antiques are nice), circuit designs, a kernel of corn, a mock-up of bubble memory, and what have you. An ideal object is one which students have not seen previously. Chances are if they've seen it before or if they know its use, they'll begin to concentrate on function rather than details of design, shape, structure, and size. Obviously, in this assignment, I don't allow students to choose an artifact from their disciplines. They will know it too well. In fact, they'll scarcely need to look at it to describe it. And worst of all, they will likely fall into old habits of using technical terms, forgetting that their readers

may not know them. In later assignments we can allow them to use materials from their own disciplines, but only after they've developed the habit of looking at objects carefully and only after they've learned to speak to the lay reader.

There's a marvelous essay entitled "Take this Fish and Look At It" by Samuel H. Scudder (Readings for Writers, Harcourt, Brace, Jovanovich, 1977, pp. 103-107). I first encountered it while teaching Freshman Composition, but I was struck by its application to technical writing, especially since I often have a number of Fishery and Wildlife Biology students in my technical writing classes. Essentially, the author is recounting an experience he had in school when he was asked simply to look at a fish and record his observations. Like most of my own students, he quickly noted down the obvious "facts" about the fish and returned to the professor. Professor Louis Agassiz was not impressed and simply advised him to look some more. I've often had to give the same advice. But after a few trials, students get in the habit of looking deeper, trying to see something the teacher hasn't seen. They often do find details, relationships, similarities I've never thought of.

Assignment number two: definition of a technical principle. For this assignment students choose a principle from their respective disciplines. The only care we must observe is that the principle be complex enough to deserve attention and to provide the kind of challenge appropriate for the assignment. Again they are required to define the principle for a lay reader; consequently, they cannot cling to the jargon they've become so accustomed to. Students need to be challenged to write for what I'm calling the lay reader. They've spent the past three or four years writing almost exclusively for the audience of one--the professor, who, having made the

assignment, knows in advance what the answers might be, is thoroughly conversant in the discipline, knows the jargon--in short, is a perfect audience. Under such circumstances, students scarcely need to communicate at all. If they are within a mile of the appropriate response, they are assured of at least some degree of success. Is this technical writing? On the other hand, writing for the lay reader, they face the same communication tasks they will face in the business world, in government, in the research center, in the journals--the same tasks any professional faces when writing to the broader audience of more than peers.

In case you've become jaded to jargon, let me give you two excerpts from recent articles I found useful for class discussion. First, from an education journal,

> Although the expected interactions between group membership and classroom social structure failed to materialize, the results of the present study contribute new information to the literature on classroom research. The quality of a student's group membership has been shown to be a salient variable for the attainment of individual student outcomes in elementary school classrooms.[6]

Or consider the following excerpt from a construction engineering journal:

> Formability of the pre-coated wall system for United Airlines Reservation Center in northern New Jersey translated into handsome dividends in fabrication and erection time and costs, according to the fabricator, Wheelan Mfg. Co.[7]

The first of these rings with "buzz words"; the second, although the author uses only one jargon term in the sentence ("formability"), suffers from structural problems caused by the jargon term. There are worse examples, of course. But these are typical. If I let them, my students would write just like this all the time. I can think of only a few occasions when they need to employ jargon, in writing designed for other specialists, for instance. On those occasions, the jargon term is preferred for its well established and unambiguous meaning within the discipline. But they've had much practice in this sort of technical writing already. I don't give them much additional practice.

But back to the assignments. We were on Assignment number two: definition of a technical principle. The student's goal here is to develop an extended definition suitable for a lay reader. Here we can introduce the metaphor in its various forms. I usually introduce the simile and metaphor in one of two ways. First, I may select excerpts containing figures of speech from scientific and technical writers, such as those in the Selected Bibliography which follows. The excerpts provide an opportunity to discuss the effectiveness of the metaphors and similes. Often I have a student who happens to be in the same discipline as the author attempt a "translation" of the metaphor into scientific language so we can note the difference. It's good to have one prepared in advance, however, since students occasionally balk at such impromptu composing. The second alternative is to introduce the technique of metaphor creation, again using examples from technical articles and books. After students feel confident with the mechanism of metaphorical language, I give them

definitions and descriptions from non-figurative examples, such as we might find in Science Digest or Scientific American, and ask them to experiment with the creation of metaphors that might be appropriate. Since most articles in these journals are written for the generalist (and most are very well written), students are usually pretty confident of their ability to understand the materials and willing to serve as editors on the spot. The second approach works best with a diverse student group representing many disciplines. After some practice on these models, students are eager to try their own definitions.

Assignment three: description of a mechanism or procedure. Before giving this assignment I introduce the use of analogy and its strength in scientific writing, the capacity to show the unknown through the known. It is difficult to locate good analogies, however. One readily available is Sir James Jeans's "Why the Sky is Blue," which may be found in Houp and Pearsall's Reporting Technical Information, 4th edition (Macmillan, 1980). With a bit of imagination, though, one can develop useful analogies to complement a non-figurative text, as I suggested earlier with metaphors.

Students will occasionally select procedures or mechanisms which do not immediately lend themselves to the use of analogy, and here we can only encourage them to try to discover an appropriate one, along with appropriate similes or metaphors. The value, I think, is in the process: for many students, just trying to develop an analogy, discovering one that will work for a particular audience, is worth the time invested. Occasionally I work with students individually or encourage htem to work together on this problem.

Assignment four: instructions. Probably most technical writing courses, whether taught at the sophomore or senior level, include instructions at some point in the syllabus. Providing instruction in metaphors and similes at the same time encourages students to search for appropriate images suitable for a lay reader as they prepare their sets of instructions. I usually allow students to choose a process from their disciplines for a set of instructions; however, a colleague of mine has suggested an alternative model that effectively makes everyone a lay reader, including the writer of the instructions.[8] For his assignment on instructions, he presents students with prepared geometric designs which have been cut into pieces--triangles, squares, rectangles, etc. All these pieces fit neatly together to form the completed figure shown on a separate sheet. The pieces are not numbered in any way. The student's task is to design a set of instructions which will allow the reader to reassemble the pieces into the original geometric design. The reader, of course, does not have access to the drawing of the completed figure. My colleague and I have both used this assignment in classes with considerable success.

Metaphors, as you might imagine, are very useful for the reader trying to visualize a completed shape with only an envelope filled with an assortment of geometric pieces of paper and a set of instructions. Since students are challenged to avoid all jargon, they must invent strategies in the use of language with which they have had little previous experience. They must treat language as a tool. They must experiment and manipulate language in ways that are new to them. Most importantly, they must consider the audience in the composing process. Even the most "non-figurative" of my students

easily recognizes that a metaphor whose tenor and vehicle are both unknowns is worse than useless: "Flagiolets are rather like flipple-flukes," to coin a phrase.

Once when I discussed this approach to technical writing with a colleague of mine in statistics, I was accused of trying to create writers like Jacob Bronowski, Elaine Morgan, Carl Sagan, or the like. What I should be doing, he contended, is creating writers for Grumman Aircraft or General Electric. He implied that I was aiming for something suspiciously close to creative writing skills. I have to confess that was partly my aim. If I may borrow a line, somewhat out of context, from Kenneth Pike's critique of tagmemic theory: "A window does not require us to see, but opens a way to look in a direction where we may choose to focus on elements to our profit."[9] Based on the premise that all types of writing (beyond the level of complexity of grocery lists) call for creative techniques of organization and expression, and most important, skills of invention that help students shape materials for a prescribed audience, creative writing skills can be just such a "window" for our students and are consistent with the goals of technical writing instruction. Besides, I wouldn't mind having a small part in the creation of a skilled writer or two during my career to match one of those I've mentioned above.

Notes

[1]In an unpublished paper entitled "Style and Audience in Technical Writing: Advice from the Early Texts"(33rd Annual Conference on College Composition and Communication, 18-20 March 1982, San Francisco), Professor Mary Rosner argues that, apart from expansion in the treatment of audience analysis, textbooks in technical writing have changed little since the earliest texts appeared around 1911. Although early authors might include a phrase or two on "emotional effectiveness" or "beauty," their advice on style is essentially the same as today's authors': good style is correct, accurate, clear, and interesting.

[2]See "Teaching Technical Communication as a Liberal Art," in Proceedings 31st Conference on College Composition and Communication: Technical Communication Sessions, ed. John A. Muller (Urbana, IL.: ATTW, 1980), pp. 219-250. At the MLA 1981 Conference, four papers were devoted to Humanistic Approaches to Technical Communication, sponsored by ATTW: "Notes Toward a History of Scientific Writing," Michael E. Connaughton, Pittsburgh State University; "The Rhetoric of Scientific Writing," Debra Journet, Clemson University; "Language and History in the Sciences and Technologies," Elizabeth Harris, University of Texas, Austin; and "What Does 'Objectivity' in Technical Writing Do?" David Dobrin, Massachusetts Institute of Technology. A session at this year's MLA Conference, chaired by Carolyn Miller, is devoted to The Use of Literary Techniques in Technical Writing.

[3]Martin Green's review-essay, "Writing About Science," College English, 43, No. 6 (Oct., 1981), 569-577, touches on issues of technical and scientific writing, especially among popularizers of science, that parallel my own and includes additional authors and titles that would be useful for classroom discussion.

[4]Quoted in Jacob Bronowski, The Ascent of Man (Boston: Little, Brown, and Company, 1973), p. 340.

[5]Aristotle, Rhetorica, translated by W. Rhys Roberts, in The Works of Aristotle, vol. 9, edited by W. D. Ross (Oxford: 1924), III, 1410b; Quintilian, Institutio Oratorio, translated by H. E. Butler (Loeb Classical Library, 1920-22), VIII, vi, 4-5.

[6]Kenneth M. Zeichner, "Group Membership in the Elementary School Classroom," Journal of Educational Psychology, 70, No. 4 (1978), 554-564.

[7]"Rising Phenomena: Tough Fluropolymer-coated Metal Buildings," Buildings, 72, No. 10 (Oct., 1978), 76-81.

[8]I am indebted to Professor Karl Gwiasda, Iowa State University, for this model assignment on instructions.

[9]Kenneth L. Pike, "Language--Where Science and Poetry Meet," College English, 26, No. 4 (Jan., 1965), 283-86, 291-92.

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